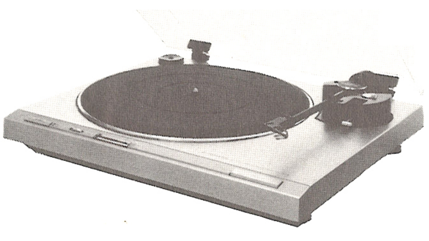
PIONEER®

Service Manual

REPAIR & ADJUSTMENTS



ORDER NO.
ART-709-0

STEREO TURNTABLE

PL-4
PL-320

MODEL PL-4 COMES IN SEVEN VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
KUT	120V only	U.S.A. model (Without cartridge)
KCT	120V only	Canada model (Without cartridge)
WE	220V – 240V	Europe model
WB	220V – 240V	United kingdom model
WP	220V – 240V	Oceania model
R	110V–120V/220V–240V (Switchable)	General export model
R/G	110V–120V/220V–240V (Switchable)	U.S. military model

MODEL PL-320 COMES IN FIVE VERSIONS DISTINGUISHED AS FOLLOWS:

Type	Voltage	Remarks
WE	220V – 240V	Europe model
WB	220V – 240V	United kingdom model
WP	220V – 240V	Oceania model
R	110V–120V/220V–240V (Switchable)	General export model
RF/G	110V–120V/220V–240V (Switchable)	U.S. military model (Without dust cover)

- This is the service manual for model PL-4/KUT. For servicing of the other types, please refer to the additional service manual.
- Ce manuel d'instruction se refère au mode de réglage, en français.
- Este manual de servicio trata del método de ajuste escrito en español.

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- **For the circuit and mechanism descriptions, please refer to the supplement of model PL-7 service manual (ART-768).**

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1. SPECIFICATIONS

Motor and Turntable

Drive System	Direct-drive
Motor	DC servo motor
Turntable Platter	310mm diam. aluminum alloy die-cast.
Speeds	33-1/3 and 45rpm
Wow and Flutter	Less than 0.025% (WRMS)
Signal-to-Noise Ratio	More than 78dB (DIN-B) (with Pioneer cartridge model PC-3MC)

Tonearm

Type	Static-balance type, Straight pipe arm
Effective Arm Length	221mm
Overhang	15.5mm
Usable Cartridge Weight	3g (min.) to 8g (max.)

Subfunctions

Auto-return mechanism, Anti-skating force control, Stylus pressure direct-readout counterweight, Cueing device, Strobe light, Free stop hinges

Miscellaneous

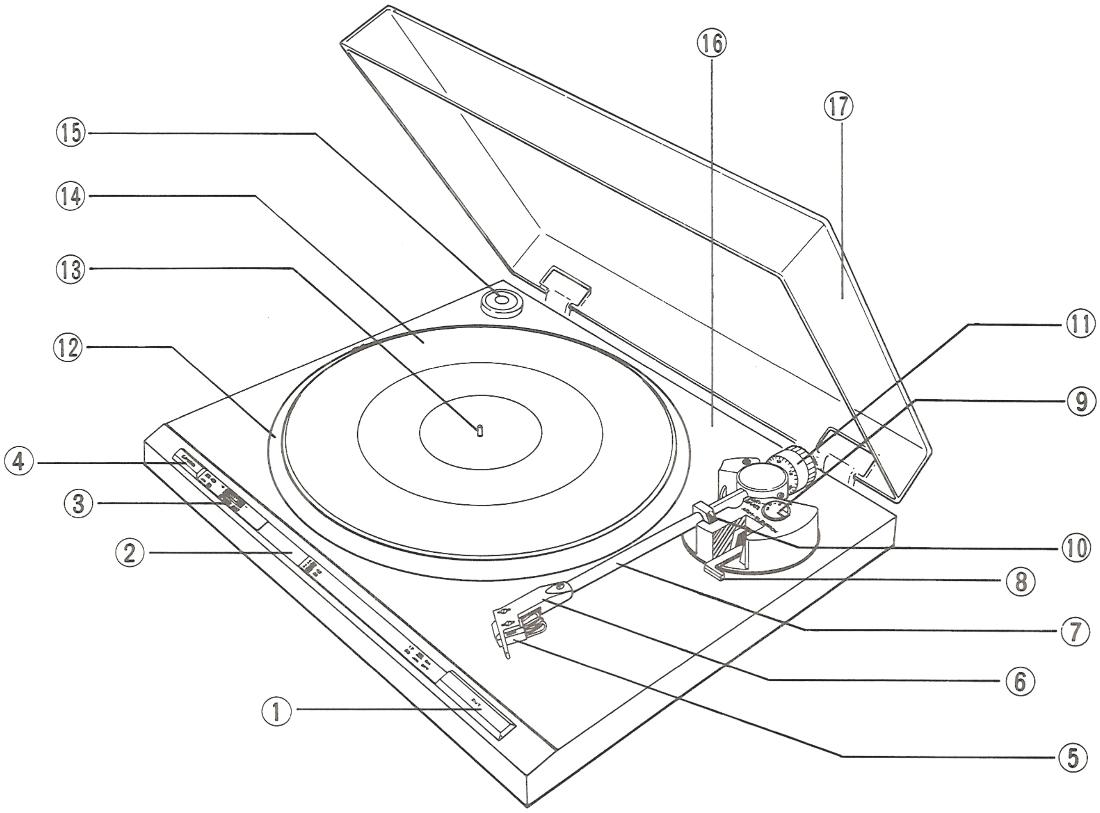
Power Requirements	AC120V, 60Hz
Power Consumption	9W
Dimensions	420(W) X 108(H) X 367(D)mm 16-1/2(W) X 4-1/4(H) X 14-7/16(D)in.
Weight	5.8kg/12 lb 12 oz

Accessories

EP Adapter	1
Operating Instructions	1

NOTE:
Specifications and design subject to possible modification without notice, due to improvements.

2. FRONT PANEL FACILITIES



① CUT switch
Depress this switch to stop play.

② Speed check window
Look through this window and observe the movement of the striped pattern when checking the rotational speed or finely adjusting the speed. The position of the striped pattern differs according to the power line frequency (50 Hz or 60 Hz) in the area of use and the speed (33 or 45 rpm) of the platter.
Top pattern: For 45 rpm in 50 Hz area
Second pattern: For 45 rpm in 60 Hz area
Third pattern: For 33 rpm in 50 Hz area
Bottom pattern: For 33 rpm in 60 Hz area

③ SPEED ADJ control
Rotate this control in order to finely adjust the speed of the platter.
The speed is reduced when the control is rotated in the [−] direction.
The speed is increased when the control is rotated in the [+] direction.

④ SPEED switch
Set this switch in accordance with the speed of the record which is to be played.
[33] (depressed position): For 33-1/3 rpm records
[45] (released position): For 45 rpm records

⑤ Cartridge

⑥ Headshell

⑦ Tonearm

⑧ ARM ELEVATION lever
Operate this lever when starting record play or when temporarily suspending play.

⑨ ANTI-SKATE control
This is rotated when performing the anti-skating adjustment.

⑩ Arm rest
This serves to hold and clamp the tonearm. When moving the tonearm, release the clamp.

⑪ Tracking force adjustment weight
This is used when adjusting the tracking force.

⑫ Platter

⑬ Platter mounting shaft

⑭ Rubber mat

⑮ EP adapter
This is used when playing records without a "middle."

⑯ Cabinet

⑰ Dust cover

3. DISASSEMBLY

3.1 PANEL AND BASE

In removing the panel, follow the below listed steps in the order given. Using any unnecessary force will result in bending the springs or damaging other parts.

Panel removal steps

1. Remove the headshell and weight assembly, and the weight shaft assembly.
   The weight shaft assembly is removed by loosening screw (Hexagone socket screw) and the headshell by loosening screw ❶ .
2. Lift off the turntable platter.
3. Loosen insulator attachment screws ❷ and remove the insulator. (Do not mix the color-coded float springs. They must be replaced with their original insulators during reassembly.)
4. Remove the rear panel PU cord strain relief.
5. Unplug the 2P and 5P connectors.
6. Completely remove the PU cord from the panel.
7. Lift up the headshell end of the tonearm, and taking care not to damage the tonearm, remove it from the panel. (Hold the tonearm steady.)

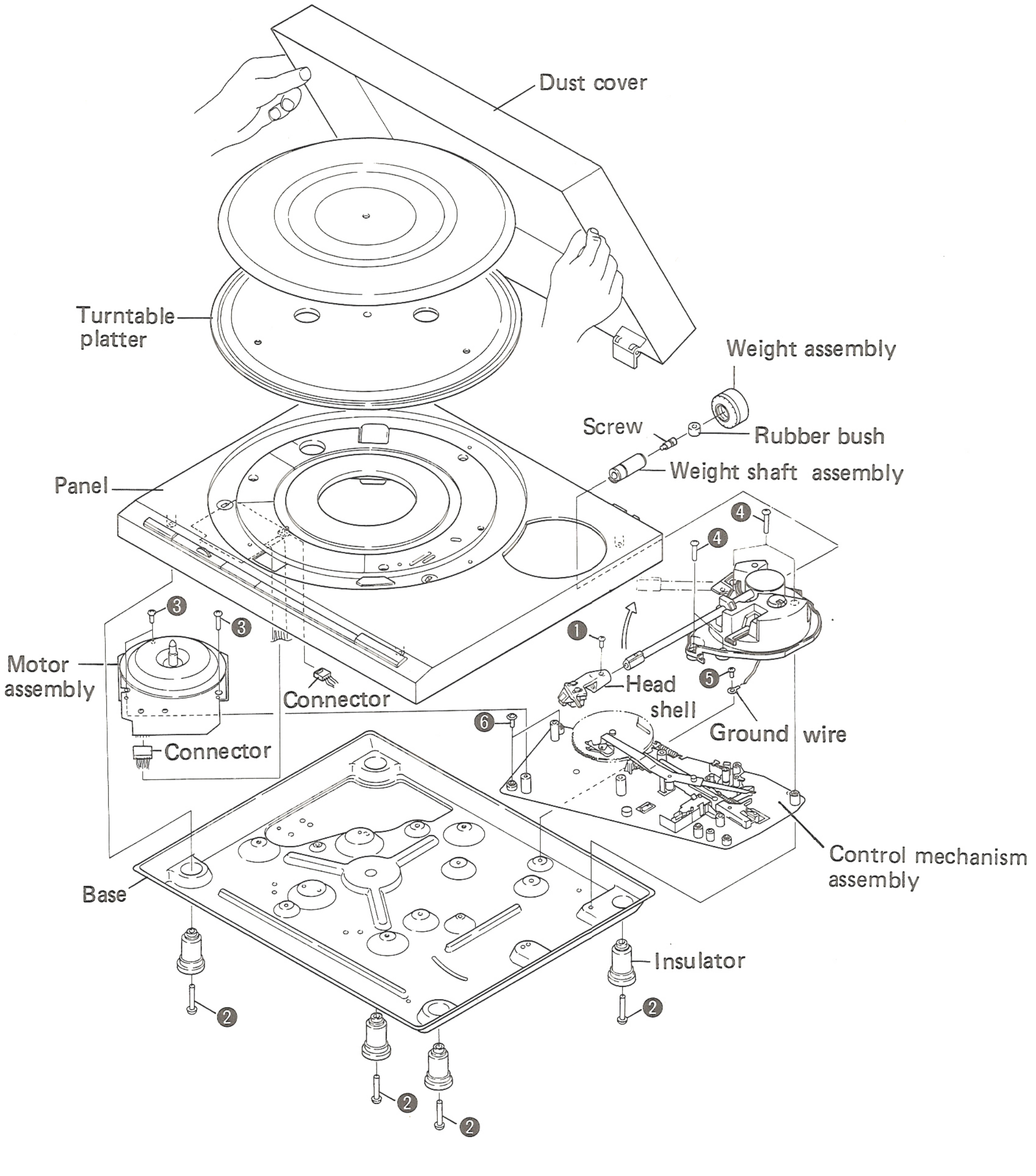

Dust cover
Turntable platter
Weight assembly
Screw
Rubber bush
Weight shaft assembly
Panel
❹
❹
❸
❸
Motor assembly
Connector
❶
Head shell
❺
Ground wire
❻
Connector
Control mechanism assembly
Base
Insulator
❷
❷
❷
❷

Fig. 3-1 Disassembly

3.2 D.D MOTOR ASSEMBLY

After the panel has been removed, loosen the three motor attachment screws ❸ and remove the motor.

3.3 TONEARM SECTION

Remove the tonearm section by taking out the three arm base attachment screws ❹ and one ground wire securing screw ❺.

3.4 CONTROL MECHANISM SECTION

After the tonearm section has been removed, loosen the three control mechanism attachment screws ❻ and remove the assembly.

3.5 TONEARM

1. Disconnect the tonearm lead wires from the PU board (See Fig. 3-2).
   Note that some of the lead wires have been soldered to the PU board, and must be disconnected with care.
2. Loosen the set screw ❼ with a screwdriver to remove the PU plate under the arm base (See Fig. 3-3).
3. Undo the screw ❽ securing the tonearm to the arm base (See Fig. 3-3).

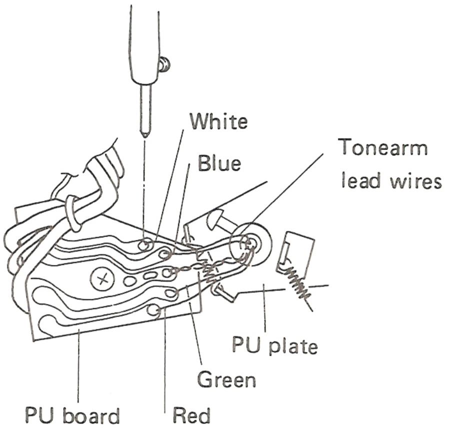

White
Blue
Tonearm lead wires
PU plate
Green
PU board
Red

Fig. 3-2 Disconnect the tonearm lead wires

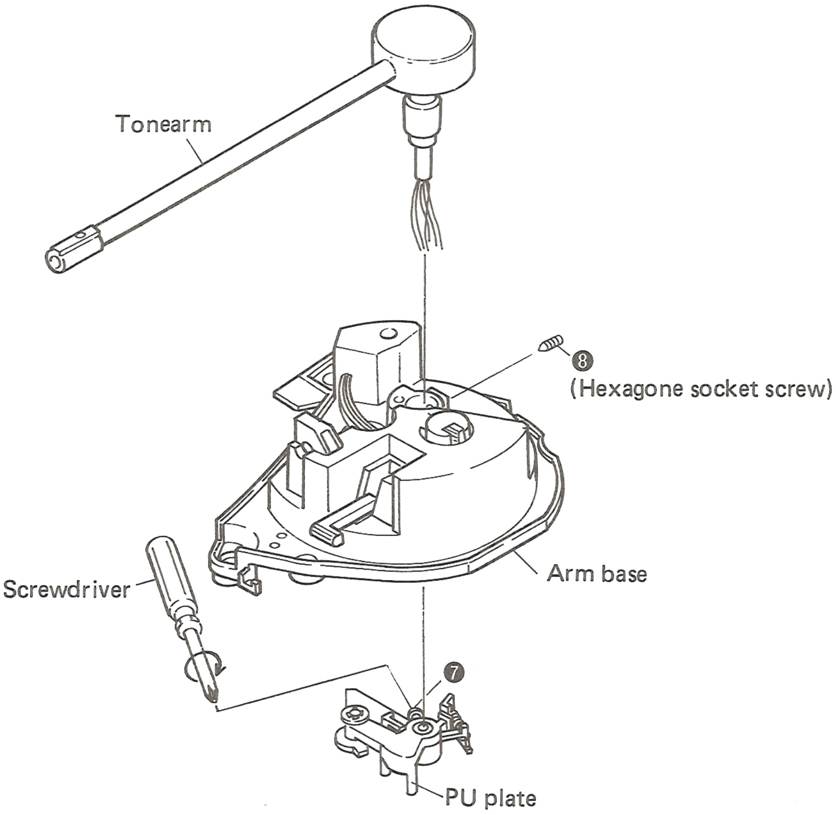
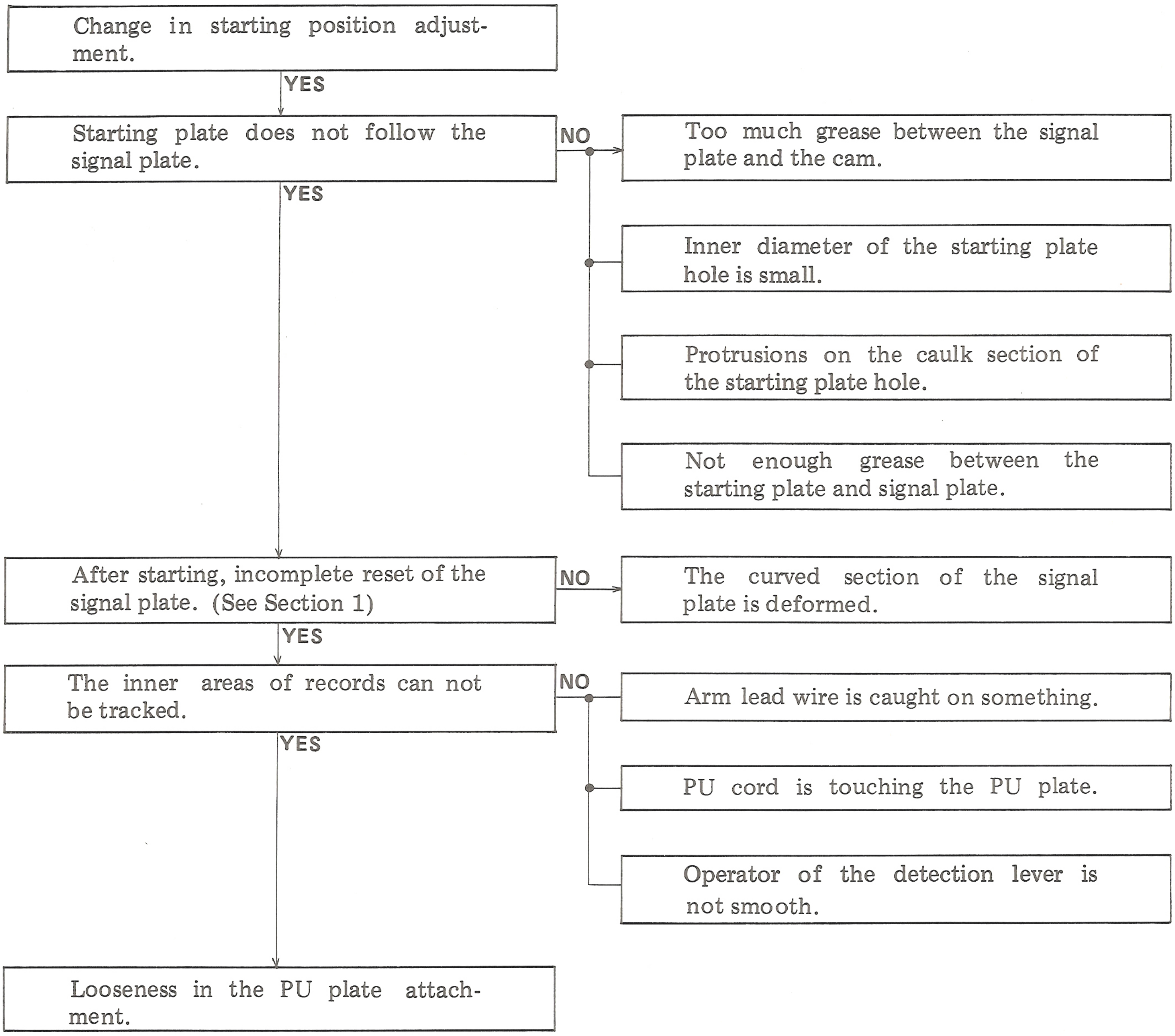

Tonearm
❽
(Hexagone socket screw)
Arm base
Screwdriver
❼
PU plate

Fig. 3-3 Remove tonearm

4. TROUBLESHOOTING

Use the following directions to find the cause of each type of breakdown. Improperly adjustment units should be completely readjusted.

■ AUTO-RETURN DOES NOT WORK


Change in starting position adjustment.
YES
Starting plate does not follow the signal plate.
NO
Too much grease between the signal plate and the cam.
Inner diameter of the starting plate hole is small.
Protrusions on the caulk section of the starting plate hole.
Not enough grease between the starting plate and signal plate.
YES
After starting, incomplete reset of the signal plate. (See Section 1)
NO
The curved section of the signal plate is deformed.
YES
The inner areas of records can not be tracked.
NO
Arm lead wire is caught on something.
PU cord is touching the PU plate.
Operator of the detection lever is not smooth.
YES
Looseness in the PU plate attachment.

Section 1

After performing the return operation, if the curved section of the signal plate and curved section of the starting plate are not in contact with surfaces Ⓐ and Ⓑ respectively of the cam, reset will be incomplete and the starting position will be late. As a result, the return function may not operate at times. In this case, bend the signal plate Ⓒ so that dimension Ⓐ is 0.5mm or larger.

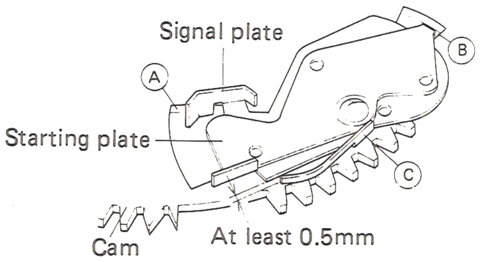

Signal plate
Ⓐ
Ⓑ
Starting plate
Ⓒ
Cam
At least 0.5mm

Fig. 4-1 Incomplete reset of starting and signal plates.

■ RETURN IS FAST (RETURN AT 1mm PITCH)

Protrusions on the pinion gear section
(See section 2)

Section 2

If there are rough areas of plastic protruding from the Ⓐ section of the protruding section of the pinion gear, the return function may operate at a pitch of only 1mm. In this case, remove the plastic protrusions completely (Fig. 4-2)

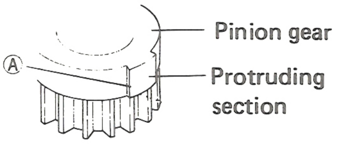


Fig. 4-2 Elimination of pinion gear protrusions

■ MOTOR DOES NOT ROTATE

2P and 5P connectors are not attached.

YES ↓

Connector(s) is not properly installed.

■ MOTOR DOES NOT STOP

The switch lever and switch locker are not locking (See section 3)

NO →

The installation location of the PU plate is incorrect.

Section 3

In order to turn the power OFF, the PU plate shaft touches surface Ⓐ of the switch locker pushing it over so it locks with the switch lever turning the microswitch OFF (Fig. 4-3). If the amount of push on the switch locker is insufficient, it can not lock with the switch lever. With the tonearm locked in the arm rest, as shown in figure 4-4, attach the PU plate precisely midway between the first and second points from the arm base scale mark counting away from you.

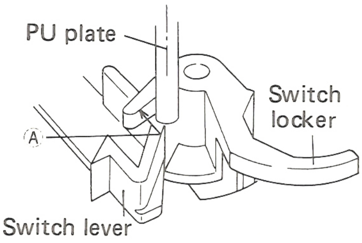


Fig. 4-3 Adjustment of switch locker

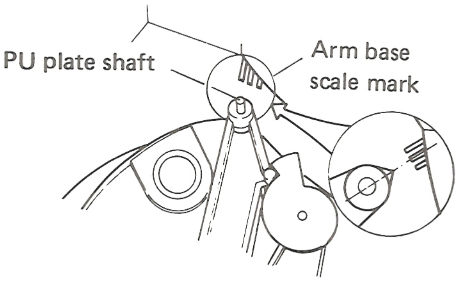


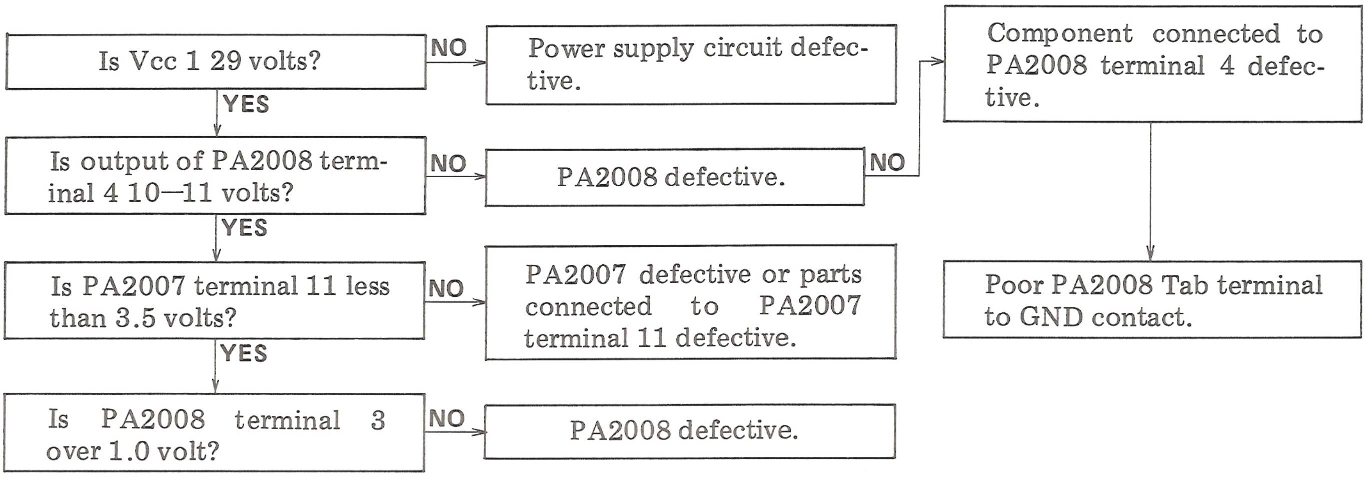
Fig. 4-4 Adjustment PU plate

■ MOTOR ASSEMBLY

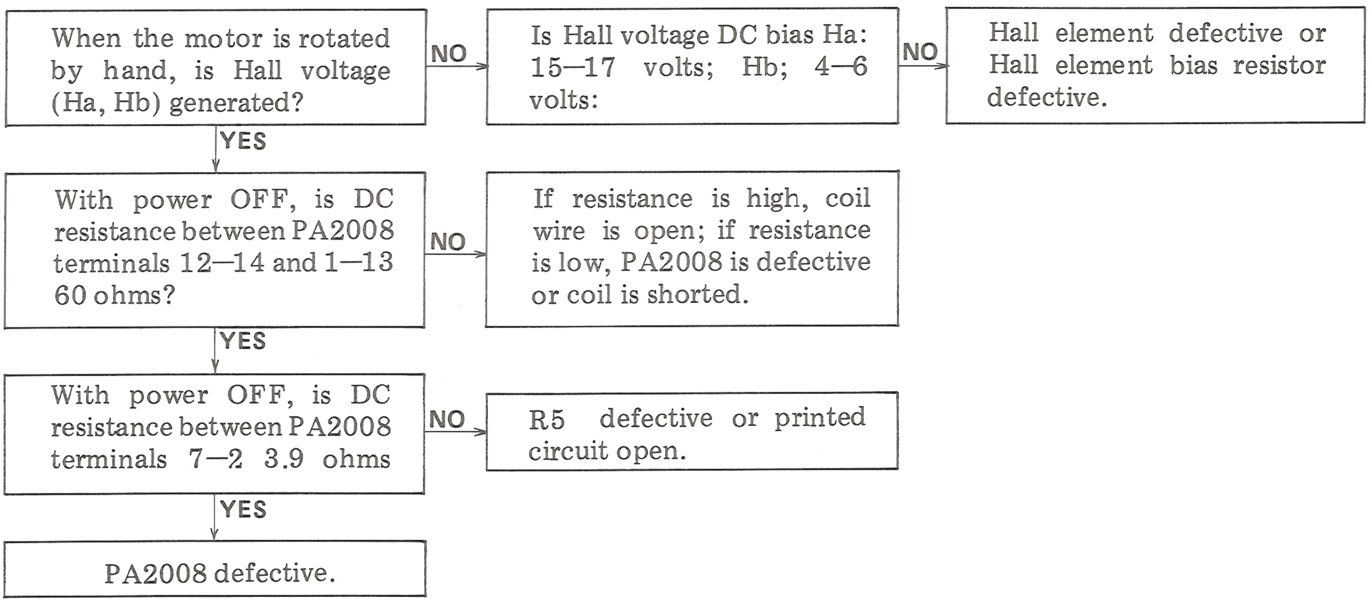
NOTE:

The IC PA2008 used in the PXM-090 does not have a dedicated ground pin for its internal circuitry, but uses the thermal fan ground. When replacing the IC, make sure the securing screws retaining the ground line between the IC and thermal dissipator and between the thermal dissipator and motor base, and base to circuit board is securely tightened.

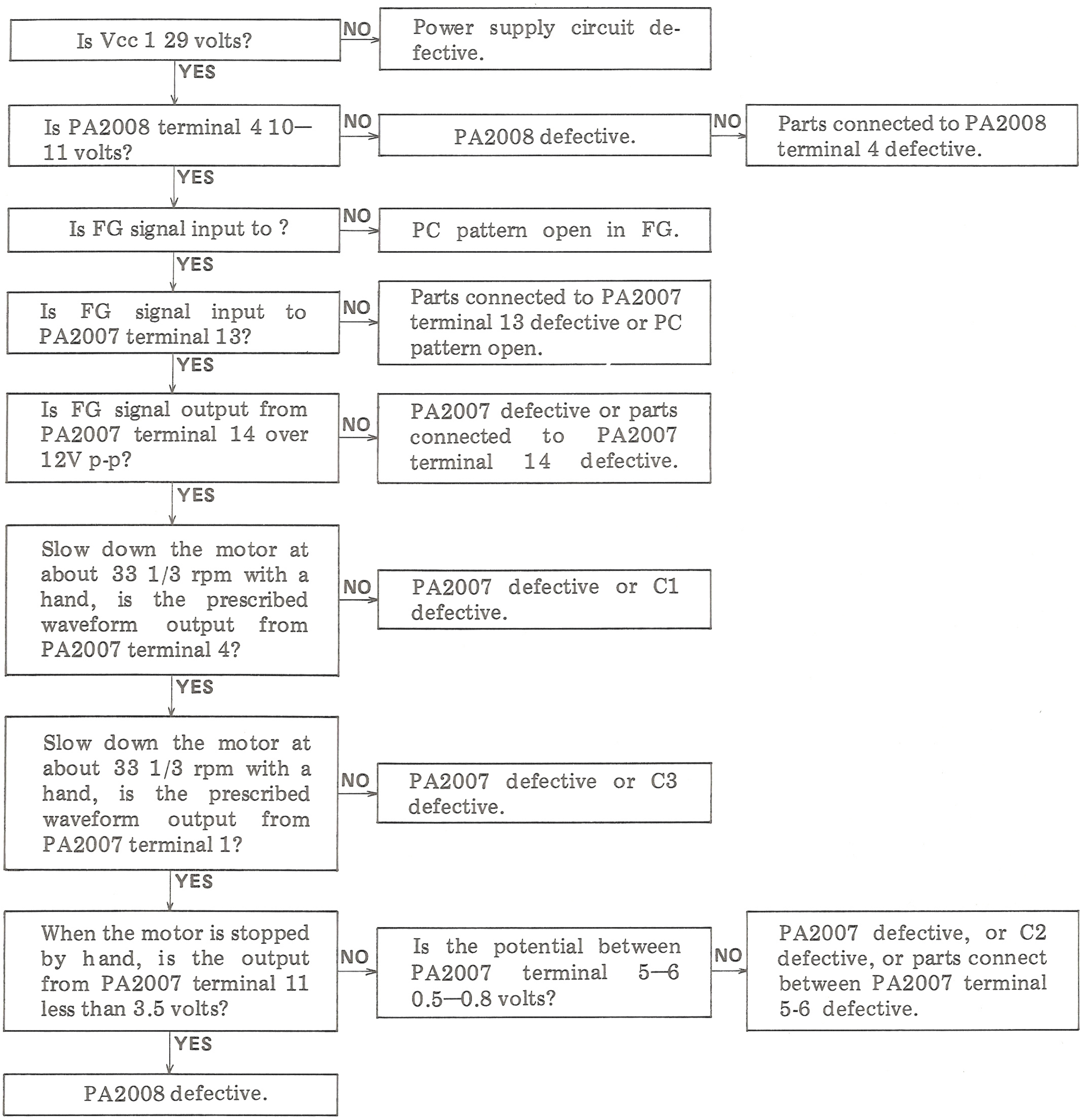
● Motor Does not Turn


Is Vcc 1 29 volts?
NO
Power supply circuit defective.
YES
Is output of PA2008 terminal 4 10—11 volts?
NO
PA2008 defective.
NO
Component connected to PA2008 terminal 4 defective.
YES
Is PA2007 terminal 11 less than 3.5 volts?
NO
PA2007 defective or parts connected to PA2007 terminal 11 defective.
Poor PA2008 Tab terminal to GND contact.
YES
Is PA2008 terminal 3 over 1.0 volt?
NO
PA2008 defective.

● Motor Does not Stop


When the motor is rotated by hand, is Hall voltage (Ha, Hb) generated?
NO
Is Hall voltage DC bias Ha: 15—17 volts; Hb; 4—6 volts:
NO
Hall element defective or Hall element bias resistor defective.
YES
With power OFF, is DC resistance between PA2008 terminals 12—14 and 1—13 60 ohms?
NO
If resistance is high, coil wire is open; if resistance is low, PA2008 is defective or coil is shorted.
YES
With power OFF, is DC resistance between PA2008 terminals 7—2 3.9 ohms
NO
R5 defective or printed circuit open.
YES
PA2008 defective.

- **Motor Runs away**


Is Vcc 1 29 volts?
NO
Power supply circuit defective.
YES
Is PA2008 terminal 4 10—11 volts?
NO
PA2008 defective.
NO
Parts connected to PA2008 terminal 4 defective.
YES
Is FG signal input to ?
NO
PC pattern open in FG.
YES
Is FG signal input to PA2007 terminal 13?
NO
Parts connected to PA2007 terminal 13 defective or PC pattern open.
YES
Is FG signal output from PA2007 terminal 14 over 12V p-p?
NO
PA2007 defective or parts connected to PA2007 terminal 14 defective.
YES
Slow down the motor at about 33 1/3 rpm with a hand, is the prescribed waveform output from PA2007 terminal 4?
NO
PA2007 defective or C1 defective.
YES
Slow down the motor at about 33 1/3 rpm with a hand, is the prescribed waveform output from PA2007 terminal 1?
NO
PA2007 defective or C3 defective.
YES
When the motor is stopped by hand, is the output from PA2007 terminal 11 less than 3.5 volts?
NO
Is the potential between PA2007 terminal 5—6 0.5—0.8 volts?
NO
PA2007 defective, or C2 defective, or parts connect between PA2007 terminal 5-6 defective.
YES
PA2008 defective.

5. PRECAUTIONS FOR REASSEMBLY

Follow these directions and precautions when reassembling a unit after completing repairs. Be sure to lubricate as required, make no mistakes when attaching parts, and avoid all other careless mistakes that may be the cause of trouble later on.

5.1 AREAS THAT REQUIRE LUBRICATION

NOTE:
Types of lubricants and areas where they are used are listed in table 1.

Table 1

Type of Oil	Areas used
Silicon Oil #50000	raising shaft
GYA-008	all other areas

Lubrication points are specified for oils other than GYA-008. Never use a different type of oil.

- **Cam Section**

Apply oil to the heart-shaped grooved section (rear side of the cam) and lock plate sliding section in order to minimize wear on the sliding section and the burden on the mechanism.

- **Driving Plate Assembly**

Decrease the burden on the mechanism and the wear on the sliding section.

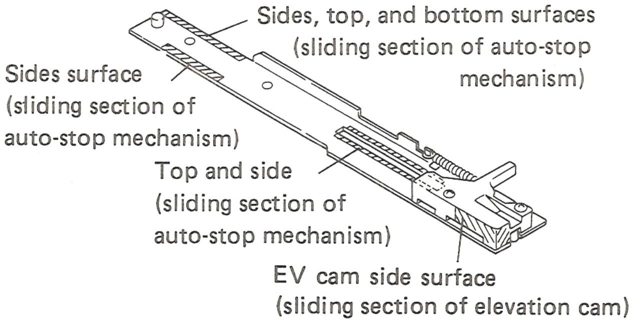

Sides, top, and bottom surfaces
(sliding section of auto-stop mechanism)
Sides surface
(sliding section of auto-stop mechanism)
Top and side
(sliding section of auto-stop mechanism)
EV cam side surface
(sliding section of elevation cam)

Fig. 5-1 Driving panel assembly section switch locker section

- **Switch Locker Section**

Apply oil to the switch locker (opening) and sub-panel base sliding section to decrease the burden on the mechanism.

When applying oil to the opening (shaft hole), do not apply any oil 2–3mm from the bottom surface. If oil is applied 2–3mm within the bottom surface, it may come out the bottom and go between the switch lever and sub-panel base causing the switch lever to operate ineffectively.

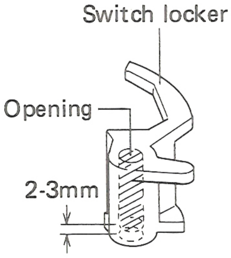

Switch locker
Opening
2-3mm

Fig. 5-2 Switch locker section

- **EV Lever Unit Section**

Apply oil to the sliding section of leaf spring (A) and EV lever unit to decrease the burden on the mechanism.

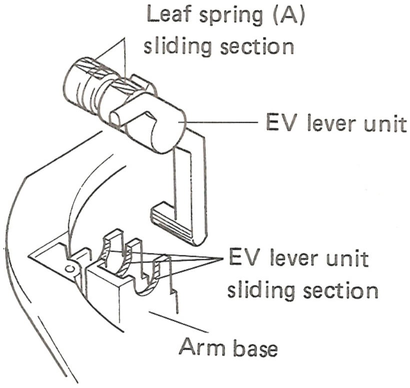

Leaf spring (A)
sliding section
EV lever unit
EV lever unit
sliding section
Arm base

Fig. 5-3 EV lever unit section

- **Elevation Cam Section**

Apply oil to the elevation cam and sliding section of the raising shaft to decrease the burden when operated.

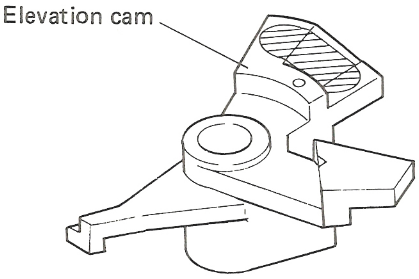

Elevation cam

Fig. 5-4 Elevation cam section

- **EV Sheet Section**

Apply oil to the raising shaft and sliding section of the bearing to assure stability in the elevation lowering speed.

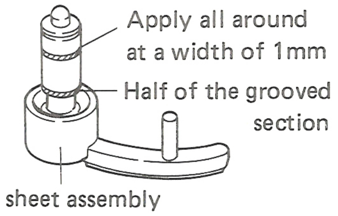

Apply all around at a width of 1mm
Half of the grooved section
EV sheet assembly

Fig. 5-5 EV sheet section

5.2 PRECAUTIONS FOR ATTACHMENT OF PARTS AND REASSEMBLY

● Motor Attachment

When installing the motor, set the cam in the mechanism stop location and verify that the starting plate section Ⓑ does not protrude beyond surface Ⓐ of the cam. If the motor is attached with the starting plate section Ⓑ protruding, the starting plate may be deformed, the motor pinion gear may be scratched, and the return function may be damaged.

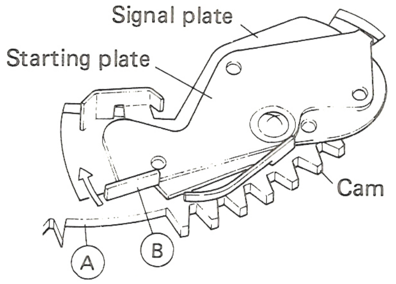

Signal plate
Starting plate
Cam
Ⓐ
Ⓑ

Fig. 5-6 Motor attachment

● PU Plate Attachment

Push the PU plate into place so that the PU plate bearing section touches the revolution shaft attachment nut. Installation direction is as shown in figure 5-7.

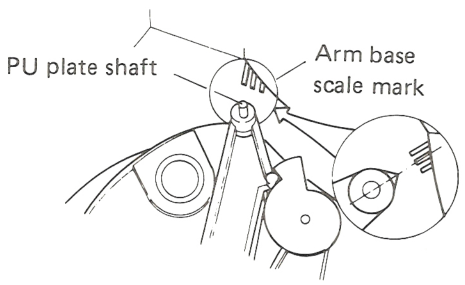

PU plate shaft
Arm base scale mark

Fig. 5-7 PU plate attachment

● AS Knob Attachment

When installing the AS knob, put the AS knob rib against the AS knob revolution control stopper (attached to the arm base) and affix with the screw. As the stopper may break, be sure to press the AS knob down firmly when installing it.

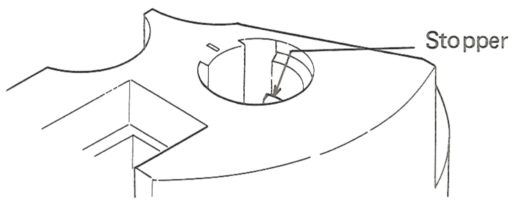


Fig. 5-8 AS knob attachment

● Arm Base Attachment

When attaching the arm base section to the mechanism section, put the mechanism section switch locker and switch lever in the locked position and verify that the tonearm is in the arm rest location. Also be sure to put the manual elevation lever in the up position and check that the PU plate shaft is in the position shown in figure 5-9.

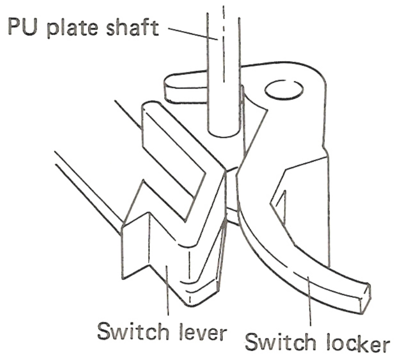

PU plate shaft
Switch lever
Switch locker

Fig. 5-9 Arm base attachment

● Wiring the Connector

When attaching the wires to the 2P connector from the microswitch, bend the lead wires from the connector housing as shown in figure 5-10 before attaching.

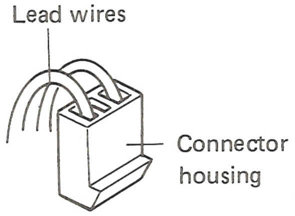
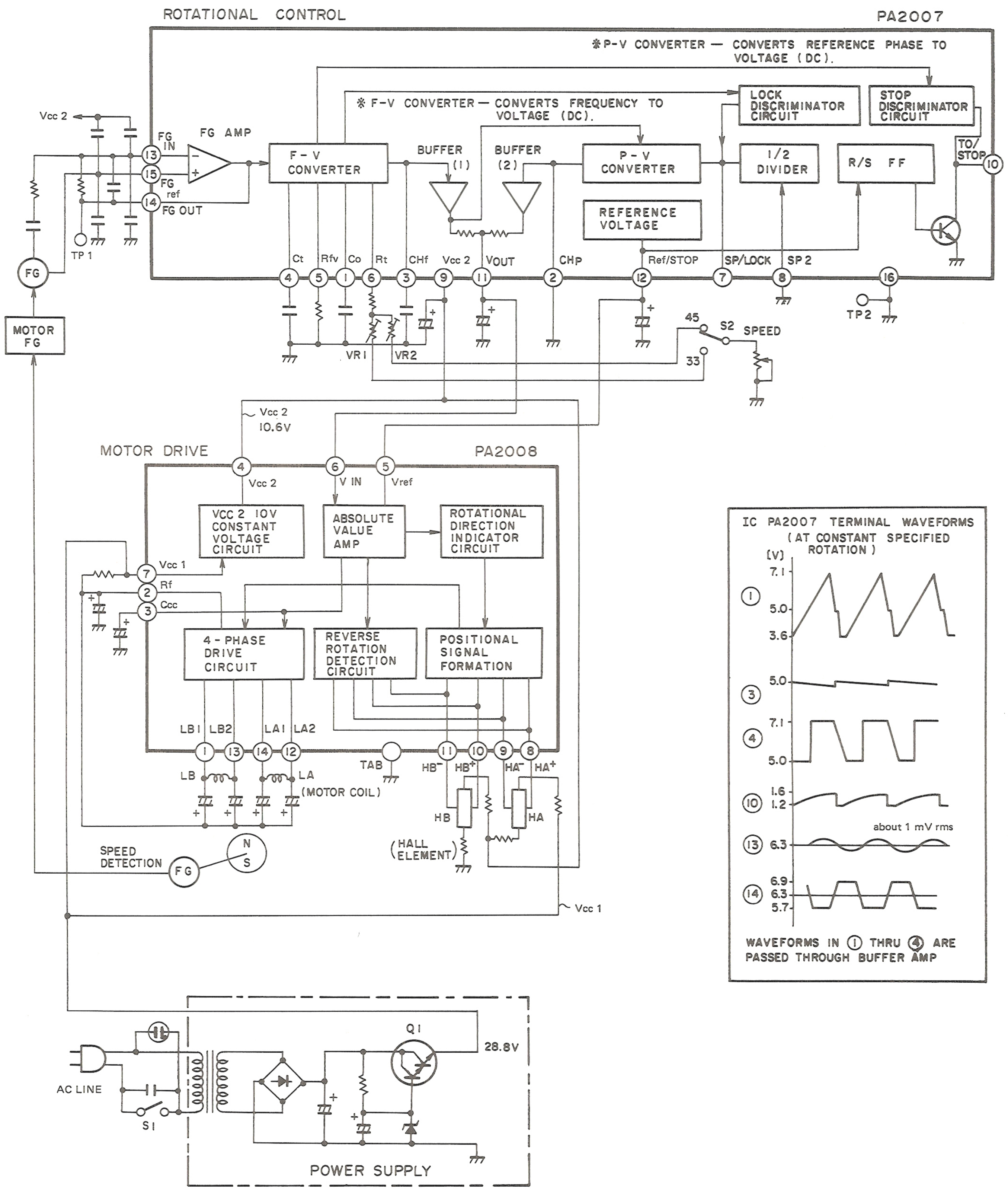
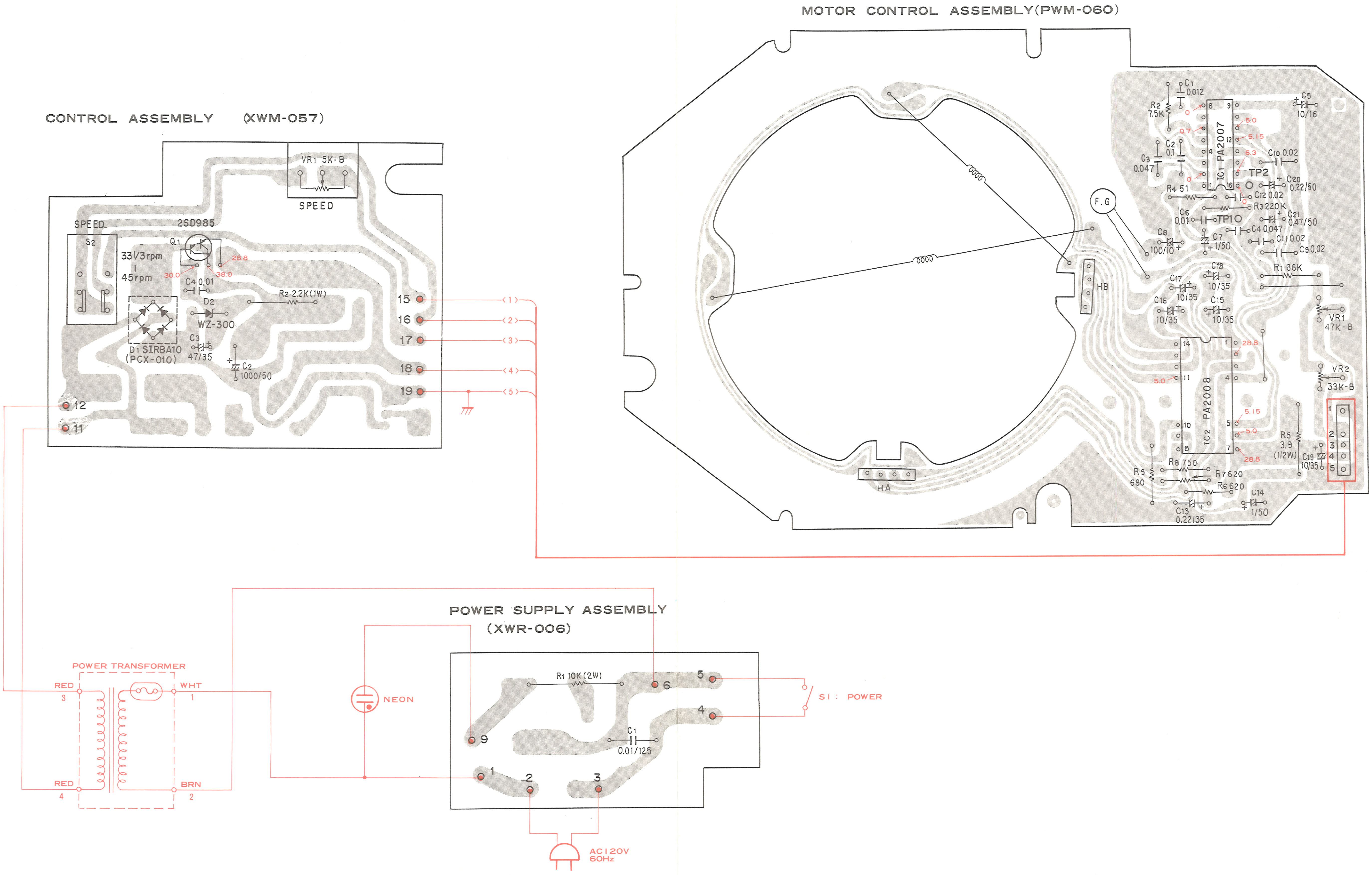

Lead wires
Connector housing

Fig. 5-10 Wiring the connector

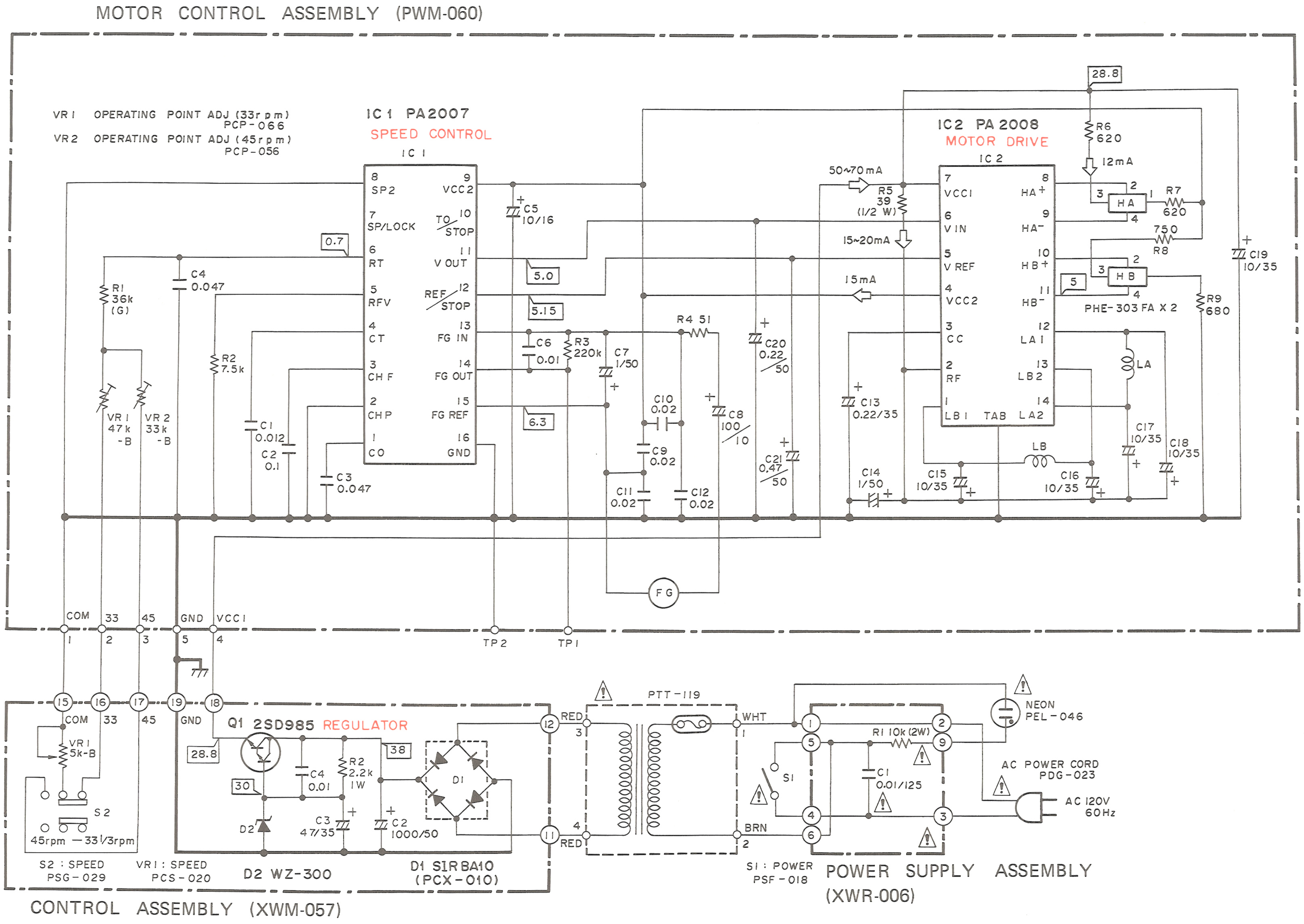
6. BLOCK DIAGRAM


ROTATIONAL CONTROL
PA2007
※P-V CONVERTER — CONVERTS REFERENCE PHASE TO VOLTAGE (DC).
※F-V CONVERTER — CONVERTS FREQUENCY TO VOLTAGE (DC).
LOCK DISCRIMINATOR CIRCUIT
STOP DISCRIMINATOR CIRCUIT
TO/STOP
Vcc 2
FG IN
FG AMP
FG ref
FG OUT
F-V CONVERTER
BUFFER (1)
BUFFER (2)
P-V CONVERTER
REFERENCE VOLTAGE
1/2 DIVIDER
R/S FF
TP 1
TP 2
FG
MOTOR FG
Ct
Rfv
Co
Rt
CHf
Vcc 2
VOUT
CHP
Ref/STOP
SP/LOCK
SP 2
VR1
VR2
45
33
S2 SPEED
Vcc 2 10.6V
MOTOR DRIVE
PA2008
Vcc 2
V IN
Vref
VCC 2 10V CONSTANT VOLTAGE CIRCUIT
ABSOLUTE VALUE AMP
ROTATIONAL DIRECTION INDICATOR CIRCUIT
Vcc 1
Rf
Ccc
4-PHASE DRIVE CIRCUIT
REVERSE ROTATION DETECTION CIRCUIT
POSITIONAL SIGNAL FORMATION
LB1 LB2 LA1 LA2
TAB
HB⁻ HB⁺ HA⁻ HA⁺
LB
LA
(MOTOR COIL)
HB
HA
(HALL ELEMENT)
SPEED DETECTION
FG
N
S
Vcc 1
Q1
28.8V
AC LINE
S1
POWER SUPPLY
IC PA2007 TERMINAL WAVEFORMS
(AT CONSTANT SPECIFIED ROTATION)
(V)
①
7.1
5.0
3.6
③
5.0
④
7.1
5.0
⑩
1.6
1.2
about 1 mV rms
⑬
6.3
⑭
6.9
6.3
5.7
WAVEFORMS IN ① THRU ④ ARE PASSED THROUGH BUFFER AMP

7. P.C.BOARDS CONNECTION DIAGRAM


MOTOR CONTROL ASSEMBLY (PWM-060)
CONTROL ASSEMBLY (XWM-057)
VR1 5K-B
SPEED
SPEED
S2
2SD985
Q1
33 1/3rpm
45rpm
28.8
30.0
38.0
C4 0.01
R2 2.2K(1W)
D2
WZ-300
D1 SIRBA10
(PCX-010)
C3
47/35
C2
1000/50
15
16
17
18
19
12
11
(1)
(2)
(3)
(4)
(5)
C1 0.012
R2 7.5K
C2 0.1
C3 0.047
IC1 PA2007
TP2
C5 10/16
C10 0.02
C20 0.22/50
R4 51
C12 0.02
R3 220K
C6 0.01
TP10
C21 0.47/50
C4 0.047
C8 100/10
C7 1/50
C11 0.02
C9 0.02
F.G
HB
C17 10/35
C18 10/35
R1 36K
C16 10/35
C15 10/35
VR1 47K-B
VR2 33K-B
IC2 PA2008
5.0
5.15
6.3
0.7
28.8
R5 3.9 (1/2W)
C19 10/35
R8 750
R9 680
R7 620
R6 620
C13 0.22/35
C14 1/50
HA
1
2
3
4
5
POWER SUPPLY ASSEMBLY (XWR-006)
POWER TRANSFORMER
RED 3
WHT 1
RED 4
BRN 2
NEON
R1 10K(2W)
C1 0.01/125
S1 : POWER
AC120V 60Hz
1
2
3
4
5
6
9

8. SCHEMATIC DIAGRAM


MOTOR CONTROL ASSEMBLY (PWM-060)
VR 1 OPERATING POINT ADJ (33rpm) PCP-066
VR 2 OPERATING POINT ADJ (45rpm) PCP-056
IC 1 PA2007
SPEED CONTROL
IC 1
8 SP2
9 VCC2
7 SP/LOCK
10 TO STOP
6 RT
11 V OUT
5 RFV
12 REF STOP
4 CT
13 FG IN
3 CH F
14 FG OUT
2 CHP
15 FG REF
1 CO
16 GND
IC2 PA 2008
MOTOR DRIVE
IC 2
7 VCC1
8 HA+
6 V IN
9 HA−
5 V REF
10 HB+
4 VCC2
11 HB−
3 CC
12 LA 1
2 RF
13 LB 2
1 LB 1
TAB
14 LA 2
0.7
5.0
5.15
6.3
28.8
5
R1 36k (G)
C4 0.047
R2 7.5k
C1 0.012
C2 0.1
C3 0.047
VR 1 47k -B
VR 2 33k -B
C5 10/16
C6 0.01
R3 220k
C7 1/50
R4 51
C10 0.02
C9 0.02
C11 0.02
C12 0.02
C8 100/10
C20 0.22/50
C21 0.47/50
FG
50~70mA
R5 39 (1/2 W)
15~20mA
15mA
12mA
R6 620
R7 620
R8 750
HA
HB
PHE-303 FA X 2
R9 680
C19 10/35
C13 0.22/35
C14 1/50
C15 10/35
C16 10/35
C17 10/35
C18 10/35
LA
LB
COM 1
33 2
45 3
GND 5
VCC1 4
TP 2
TP 1
15 16 17 19 18
COM 33 45 GND
VR1 5k-B
S2
45rpm — 33 1/3rpm
S2 : SPEED PSG-029
VR1 : SPEED PCS-020
Q1 2SD985 REGULATOR
28.8
38
30
C4 0.01
R2 2.2k 1W
C3 47/35
C2 1000/50
D2
D1
D2 WZ-300
D1 S1RBA10 (PCX-010)
12 RED 3
11 RED 4
PTT-119
WHT 1
BRN 2
1 2 5 9 4 3 6
R1 10k (2W)
C1 0.01/125
S1
NEON PEL-046
AC POWER CORD PDG-023
AC 120V 60Hz
S1 : POWER PSF-018
CONTROL ASSEMBLY (XWM-057)
POWER SUPPLY ASSEMBLY (XWR-006)

1. RESISTORS:
Indicated in Ω, ¼W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% (M) : ± 20% tolerance

2. CAPACITORS:
Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE, CURRENT:
▭ : DC voltage (V) at no input signal
⇦ mA : DC current at no input signal

4. OTHERS:
⊘ : Adjusting point.
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

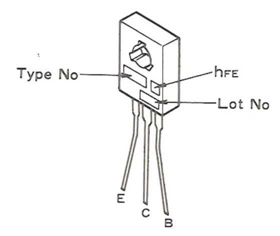
SWITCHES:

S1 : POWER ON — OFF
S2 : SPEED 33 1/3 rpm — 45rpm

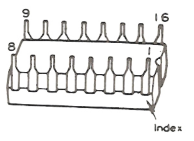
The underlined indicates the switch position.

External Appearance of Transistors and ICs

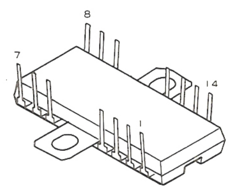
2SD985


Type No
hFE
Lot No
E
C
B

PA2007

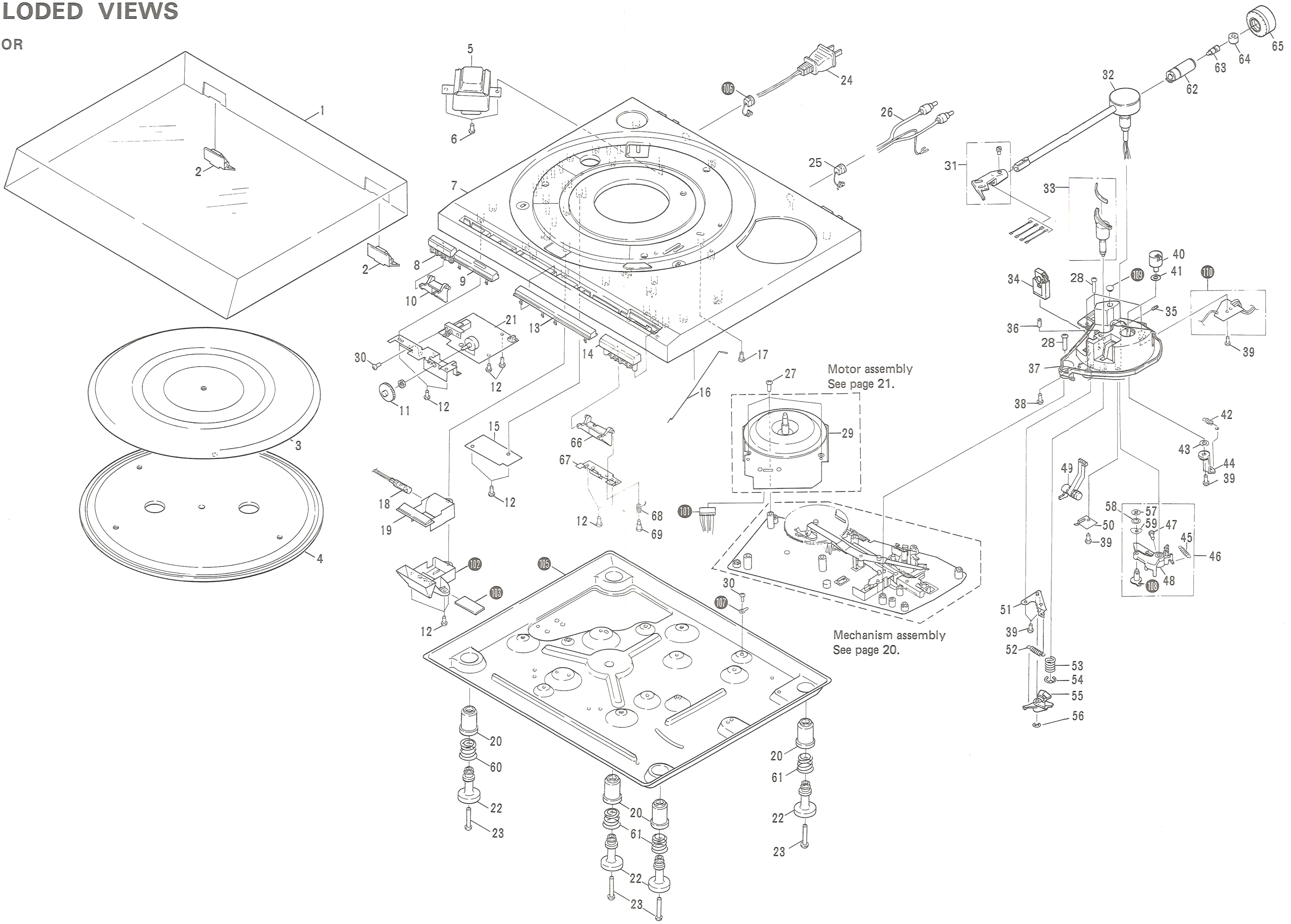

9
16
8
1
Index

PA2008



9. EXPLODED VIEWS

9.1 EXTERIOR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(101)
(102)
(103)
(105)
(106)
(107)
(108)
(109)
(110)
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6
A
B
C
D

Motor assembly
See page 21.

Mechanism assembly
See page 20.

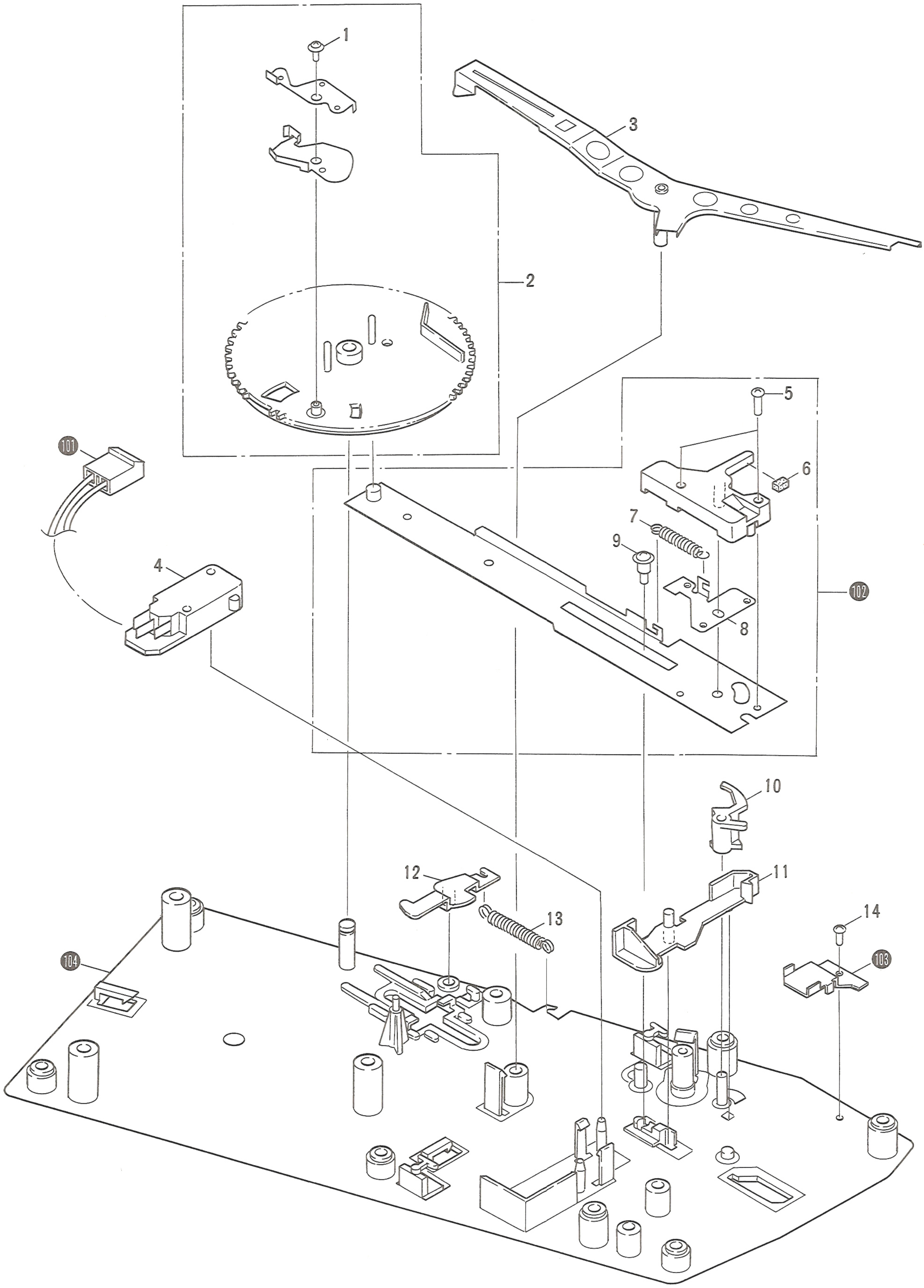
NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Parts List

Mark	No.	Part No.	Description
★	1.	PNV-034	Dust cover
★	2.	PXB-155	Hinge assembly
	3.	PEA-057	Rubber mat assembly
	4.	PNR-164	Turntable platter
⚠ ★	5.	PTT-119	Power transformer (120V)
	6.	PLZ40P120FMC	Screw
	7.	PNX-279	Panel
	8.	PAD-088	SP knob (A) unit
	9.	PAM-076	Front name plate (C)
	10.	PNX-292	Switch lever (B)
	11.	PAC-086	Adjustment knob
	12.	PPZ30P080FMC	Screw
	13.	PAM-078	Front name plate (E)
	14.	PAD-093	C knob unit
	15.	XWR-006	Power supply assembly
	16.	PXB-241	Cut pole assembly
	17.	IPZ30P080FMC	Screw
⚠ ★★	18.	PEL-046	Neon lamp
	19.	PNX-298	Lens holder
	20.	PEB-194	Damper cushion
	21.	XWM-057	Control assembly
	22.	PNX-293	Holder
	23.	PBA-118	Screw
⚠	24.	PDG-023	Power cord
	25.	PEC-056	Strain relief
	26.	PDE-064	PU cord
	27.	PBA-124	Screw
	28.	PBA-108	Screw
★★	29.	PXM-090	Motor
	30.	PDZ30P050FMC	Screw
	31.	PXA-882	Headshell assembly
★	32.	PPD-624	Tonearm assembly
★	33.	PXB-227	EV sheet assembly
★	34.	PXB-247	Tonearm rest assembly
	35.	ZMD40H080FBT	Screw
	36.	ZMR30H150FZK	Screw
	37.	PNX-341	Tonearm base
	38.	IPZ30P100FMC	Screw
	39.	VBZ30P080FMC	Screw
	40.	PAC-100	AS knob
	41.	PBF-017	Washer
	42.	PBH-292	Spring
	43.	PBE-012	AS spring washer
	44.	PNX-335	AS plate
	45.	PBH-308	PU plate spring
	46.	PXB-231	PU plate (B) assembly
	47.	PMD40P080FMC	Screw
	48.	PNX-301	PU plate (A)
	49.	PNX-336	EV cam lever
	50.	PBK-053	EV plate spring (A)
	51.	PXT-462	EV plate spring (B) unit
	52.	PBH-238	EV cam spring
	53.	PBH-293	EV spring
	54.	YE50S	E-type washer
	55.	PNX-339	EV cam
	56.	YE30S	E-type washer
	57.	YS40FBT	Fixed washer
	58.	WC40FMC	Plate washer
	59.	PNC-227	PU plate spring washer
	60.	PBH-295	Spring
	61.	PBH-294	Spring
	62.	PXT-596	Weight shaft unit
	63.	PBA-535	Screw
	64.	PNT-554	Rubber bush
	65.	PXB-501	Weight assembly
	66.	PNX-303	Switch lever
	67.	PNC-217	Base (B)
	68.	PBH-307	Spring
	69.	PBA-086	Screw
	101.		Connector
	102.		Strobe holder
	103.		Mirror
	104.		Cut base
	105.		Base
	106.		Strain relief
	107.		Lead unit (GND)
	108.		Adjust cam
	109.		Rubber bush
	110.		PU cord assembly

9.2 MECHANISM ASSEMBLY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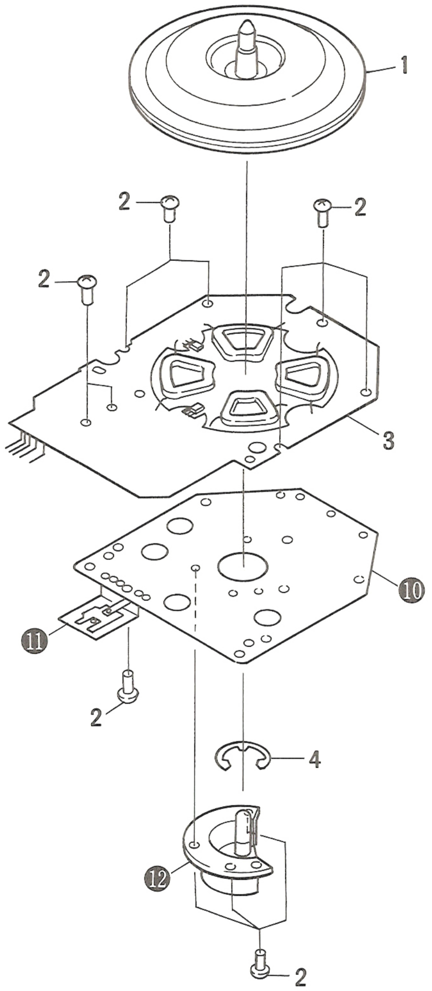
101
102
103
104
A
B
C
D

Parts List

Mark	No.	Part No.	Description
	1.	PBA-126	Screw
	2.	PYY-100	Cam assembly
	3.	PXT-446	Detector lever unit
⚠ ★★	4.	PSF-018	Microswitch
	5.	PMZ26P100FMC	Screw
	6.	PEC-065	EV cam buffer
	7.	PBH-224	Start plate spring
	8.	PNC-220	Start plate
	9.	PBA-123	Screw
	10.	PNX-031	Switch lock angle
	11.	PNX-030	Switch lever
	12.	PNX-035	Lock plate
	13.	PBH-225	Lock plate spring
	14.	PDZ30P050FMC	Screw
	101.		Connector assembly
	102.		Driving plate assembly
	103.		Protection plate
	104.		Sub-panel unit

9.3 MOTOR ASSEMBLY (PXM-090)



Parts List

Mark	No.	Part No.	Description
	1.	PXT-458	Rotor unit
	2.	PSZ30P050FMC	Screw
	3.	PWM-060	Motor control assembly
	4.		E ring (ETW-12)
	10.		Base
	11.		Heat sink
	12.		Shaft holder

10. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

  560Ω 56×10^1 561 ..... RD¼PS $\boxed{5}\boxed{6}\boxed{1}$ J
  $47k\Omega$ 47×10^3 473 ..... RD¼PS $\boxed{4}\boxed{7}\boxed{3}$ J
  0.5Ω 0R5 .... RN2H $\boxed{0}\boxed{R}\boxed{5}$ K
  1Ω 010 .... RS1P $\boxed{0}\boxed{1}\boxed{0}$ K

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

  $5.62k\Omega$ 562×10^1 5621 .... RN¼SR $\boxed{5}\boxed{6}\boxed{2}\boxed{1}$ F
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*

  ★★ GENERALLY MOVES FASTER THAN ★

  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Power Supply Assembly (XWR-006)

Mark	Part No.	Symbol & Description	
⚠	PCL-036	C1	Capacitor
⚠	RS2PF 103J	R1	Resistor

Control Assembly (XWM-057)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	2SD985-K	Q1
★	WL02	D1
★	WZ-300	D2

SWITCH, CAPACITORS and RESISTORS

Mark	Part No.	Symbol & Description
★★	PSG-029	S2
	CEA102M 59L	C2
	CEA470M 35L	C3
	CKDYF103Z 50	C4
★	PCS-016	VR1
	RS1PF222J	R2

Motor Control Assembly (PWM-060)

CAPACITORS

Mark	Part No.	Symbol & Description
	CQMA 123K 50	C1
	CKDYF 104Z 50	C2
	CQMA 473K 50	C3
	CKDYF 473Z 50	C4
	CEA 100P 16	C5
	CKDYF 103Z 50	C6
	CEA 010P 50	C7,C14
	CEA 101P 10	C8
	CKDYF 203Z 50	C9–C12
	CSZA R22M 35	C13
	CEA 100P 35	C15–C19
	CEANL R22M 50	C20
	CEA R47P 50	C21

RESISTORS

NOTE: When ordering resistors, convert the resistance value into code form, and then rewrite the part no. as before.

Mark	Part No.	Symbol & Description
	RD 1/4 PM □□□J	R2–R4,R6–R9
	RD1/2PS 3R9J	R5
	RN1/4PR 363G	R1
★	PCP-052	VR1 (47k-B)
★	PCP-056	VR2 (33k-B)

SEMICONDUCTORS

Mark	Part No.	Symbol & Description
★★	PA2007	IC1
★★	PA2008	IC2

OTHERS

Mark	Part No.	Symbol & Description	
★	PCX-039	HA,HB	Hall element

11. ADJUSTMENTS

11.1 AUTO-RETURN ADJUSTMENT

1. Turn the auto return adjustment screw full around counter-clockwise.
2. When the auto return adjustment screw is turned back a little at a time clockwise, the tonearm will commence to return to the outer circumference.
3. Stop turning the adjustment screw once the stylus tip is 33mm away from the center shaft.
4. Once the above adjustment procedure has been completed, check that the tonearm returns automatically as designed.

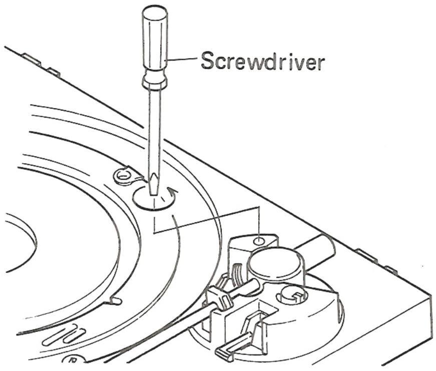


Fig. 11-1 Auto-return adjustment

11.2 ARM-ELEVATION ADJUSTMENT

To proceed with the elevation sheet height adjustment, insert the hexagonal wrench (for 3mm) into the hole at the front of the EV sheet and rotate it clockwise to reduce the height and counter-clockwise to increase the height. The height of the stylus tip from the record surface is 7 ±2mm.

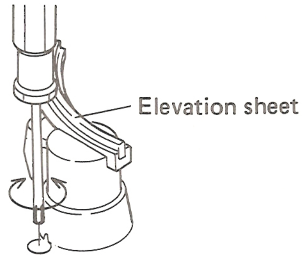
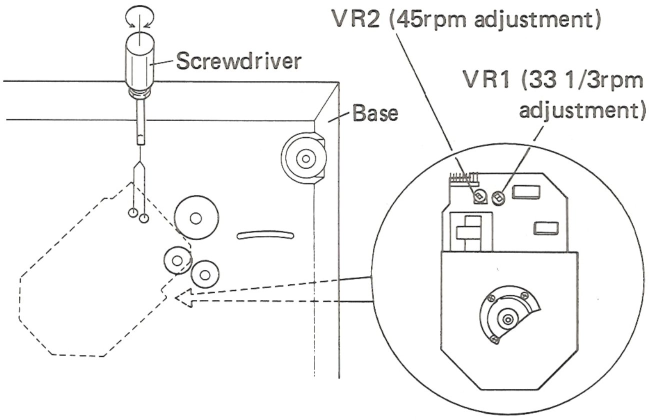


Fig. 11-2 Arm-elevation adjustment

11.3 MOTOR OPERATING POINT ADJUSTMENT

1. Press the START/STOP button to start the turntable.
2. Set the player speed adjustment knob to the mechanical center.
3. Adjust the semi-fixed resistor on the motor control assembly so that the strobo stops. (Fig. 11-3)



(Bottom of motor)

Fig. 11-3 Motor adjustment

11. RÉGLAGE

11.1 RÉGLAGE DU RETOUR AUTOMATIQUE DU BRAS

1. Tourner la vis de réglage du retour automatique du bras à fond dans le sens contraire des aiguilles d'une montre.
2. Lorsque la vis de réglage du retour automatique du bras est tournée d'une petite quantité dans le sens des aiguilles d'une montre, les bras de lecture commence à retourner vers la périphérie du plateau.
3. Arrêter de tourner la vis de réglage lorsque l'extrémité de la pointe de lecture se trouve à 33mm de l'axe central.
4. Lorsque le réglage décrit ci-dessus est terminé, vérifier que le bras de lecture retourne automatiquement de la manière désirée.

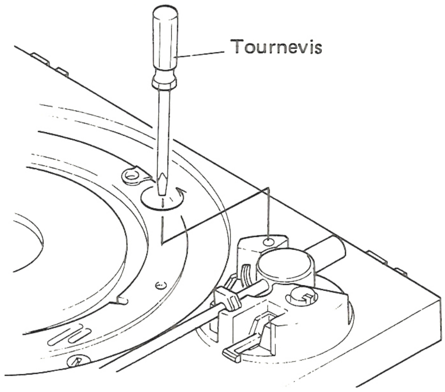


Fig. 11-1 Réglage du retour automatique du bras

11.2 RÉGLAGE DE LA MONTÉE DU BRAS

Pour régler la hauteur de la plaque de montée, introduire une clé hexagonale (de 3mm) dans le trou situé devant la plaque "EV" et la tourner dans le sens des aiguilles d'une montre pour réduire la hauteur, ou dans le sens contraire des aiguilles d'une montre pour augmenter la hauteur. La hauteur de l'extrémité de la pointe de lecture au-dessus de la surface du disque est de 7 ±2mm.

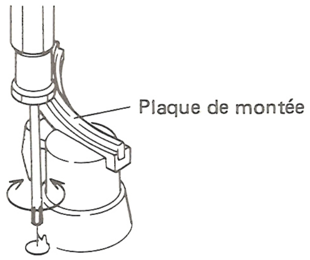


Fig. 11-2 Réglage de la montée du bras

11.3 RÉGLAGE DU POINT DE FONCTIONNEMENT DU MOTEUR

1. Appuyer sur la touche START/STOP pour faire démarrer le tourne-disque.
2. Régler le bouton de réglage de vitesse de la platine sur la position mécanique centrale.
3. Régler la résistance ajustable de l'assemblée contrôle de moteur à ce que le motif stroboscopique s'arrête (Fig. 11-3).

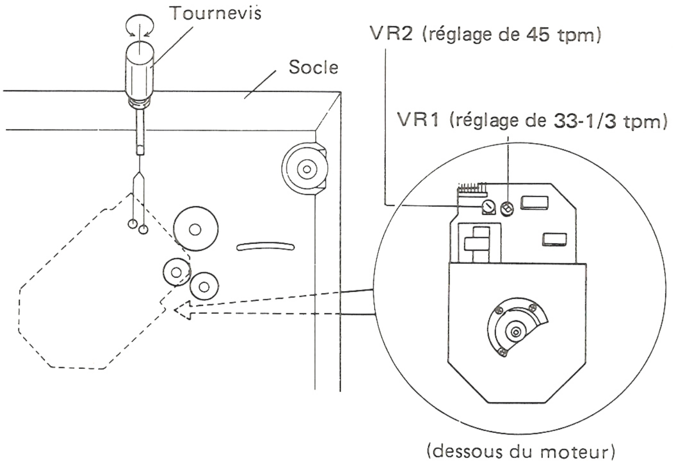


Fig. 11-3 Réglage de la vitesse du moteur

11. AJUSTE

11.1 AJUSTE PARA EL RETORNO AUTOMATICO

1. Girar el tornillo de ajuste del retorno automático completamente hacia la izquierdal.
2. Cuando el tornillo de ajuste del retorno automático se gira un poco hacia la derecha, el brazo fonocaptor empezará a volver hacia la circunferencia exterior.
3. Dejar de girar el tornillo de ajuste cuando la punta de la aguja esté a 33mm del eje central.
4. Una vez realizado el ajuste arriba mencionado, comprobar que el brazo fonocaptor retorna automáticamente como se ha designado.

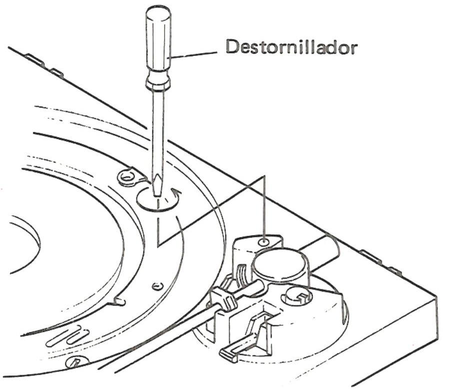


Fig. 11-1 Ajuste del retorno automático

11.2 AJUSTE DE LA ELEVACIÓN DEL BRAZO

Para proceder con el ajuste de la altura del dispositivo de elevación, insertar la llave de apriete hexagonal (de 3mm) en el orificio de la parte frontal del dispositivo de elevación y girarla hacia la derecha para reducir la altura y hacia la izquierda para aumentarla. La altura de la punta de la aguja desde la superficie del disco deberá ser de 7 ±2mm.

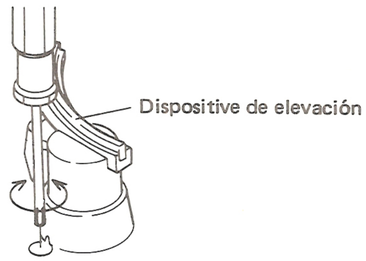


Fig. 11-2 Ajuste de la elevación del brazo

11.3 AJUSTE DEL PUNTO DE ÓPERACION DEL MOTOR

1. Presionar el botón de inicio/parada (START/STOP) para poner en funcionamiento el giradiscos.
2. Ajustar el mando de ajuste de la velocidad del giradiscos en el centro mecánicamente.
3. Ajustar el resistor semifijo del conjunto de la control del motor de modo que se detenga el estroboscopio. (Fig. 11-3).

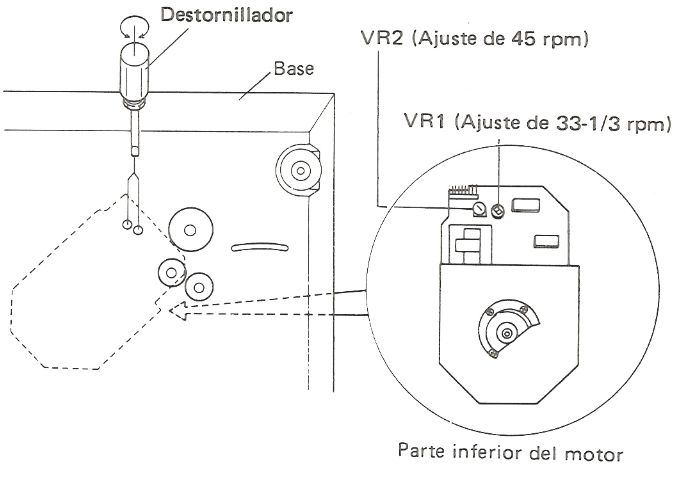
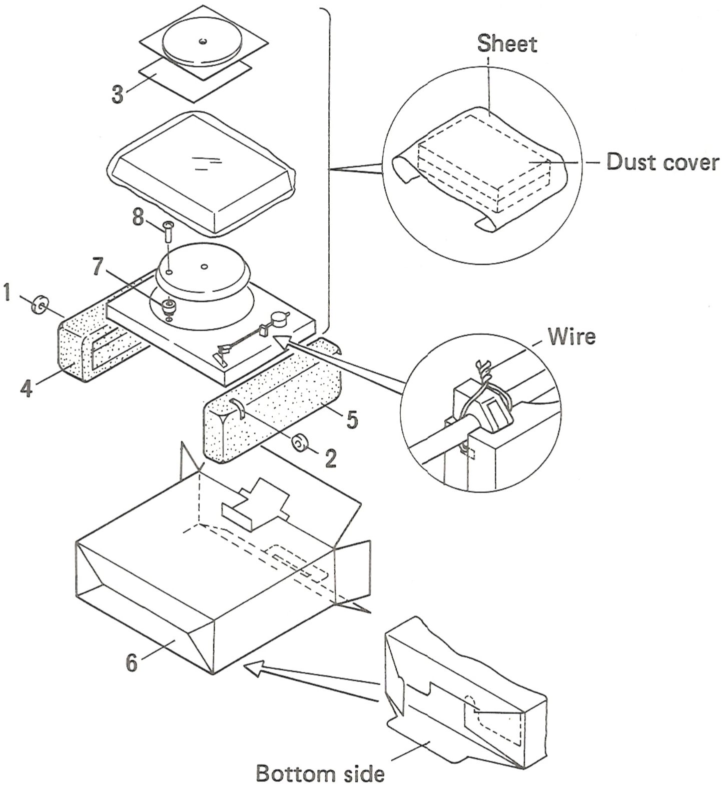


Fig. 11-3 Ajuste de la rotación del motor

12. PACKING


Sheet
Dust cover
Wire
Bottom side
1
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7
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Parts List

Mark	No.	Part No.	Description
	1.	N93-603	45 adaptor
	2.	PXB-501	Weight assembly
	3.	PRB-191	Operating instructions
	4.	PHA-127	Protector (L)
	5.	PHA-128	Protector (R)
	6	PHG-441	Packing case
	7.	PNX-294	Turntable platter packing
	8.	PBA-100	Screw
	9.		
	10.		

ADDITIONAL

Service Manual

PIONEER®

ORDER NO.
ART-711-0

STEREO TURNTABLE

PL-4 KCT,R,R/G
PL-320 R,RF/G

- This additional service manual is applicable to the PL-4/KCT,R,R/G and PL-320/R,RF/G types.
- This basic performance of the PL-4/KCT, R, R/G and PL-320/R, RF/G types is the same as the PL-4/KUT type. Please refer to the PL-4/KUT type service manual (ART-709) with the exception of this supplements.
- Both model PL-4 and PL-320 have the same basic mechanism and performance. The only difference is in appearance.

1. SPECIFICATIONS

The specifications for PL-4/KCT, R, R/G and PL-320/R, RF/G types are the same as the PL-4/KUT type except for following sections.

Miscellaneous

Power Requirements	
PL-4/KCT type	AC120V 50/60Hz
PL-4/R, R/G, and PL-320/R, RF/G types	AC110V—120V/220V—240V (Switchable) 50/60Hz
Power Consumptions	
PL-4/KCT type	9W
PL-4/R, R/G, and PL-320/R, RF/G types	12W
Cartridge	
Without cartridge	PL-4/KUT,KCT types
PC-3MC	PL-4/R, R/G, PL-320/R, RF/G types
Dust Cover	
With dust cover	PL-4/KCT, R, R/G and PL-320/R types
Without dust cover	PL-320/RF/G type

PC-3MC Specifications

Type	Moving coil type
Stylus	0.5mil diamond (PN-3MC)
Output voltage	2.5mV (1kHz, 50mm/s Peak velocity, LAT)
Tracking force	1.7g to 2.3g (proper 2g)
Frequency response	10 to 32,000Hz
Recommended load	50kΩ
Weight	3.1g

PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
U.S. PIONEER ELECTRONICS CORPORATION 85 Oxford Drive, Moonachie, New Jersey 07074, U.S.A.
PIONEER ELECTRONIC (EUROPE) N.V. Luithagen-Haven 9, 2030 Antwerp, Belgium
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2. CONTRAST OF MISCELLANEOUS PARTS

NOTES:
- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

PL-4/KCT, R, R/G and PL-320/R, RF/G types are the same as the PL-4/KUT type except for following sections.

MISCELLANEOUS PARTS

Mark	Symbol & Description	Part No.						Remarks
		PL-4 KUT type	PL-4 KCT type	PL-4 R type	PL-4 R/G type	PL-320 R type	PL-320 RF/G type	
	Panel	PNX-348	←	PNX-321	←	PNX-329	←	
	Front name plate (C)	PAM-076	←	←	←	PAM-082	←	
	Front name plate (E)	PAM-078	←	←	←	PAM-085	←	
	SP knob (A) unit	PAD-088	←	←	←	. . . .	. . . .	
	SP knob (B) unit	. . . .	. . . .	. . . .	. . . .	PAD-090	←	
	Adjustment knob	PAC-086	←	←	←	PAC-092	←	
	C knob (B) unit	PAD-093	←	←	←	PAD-095	←	
	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	
	AS knob	PAC-100	←	←	←	PAC-101	←	
	EV cam lever	PNX-336	←	←	←	PNX-344	←	
⚠ ★★	S51 Microswitch	PSF-020	PSF-018	PSF-020	←	←	←	
⚠ ★	Power transformer (120V)	PTT-119	PTT-139	. . . .	. . . .	. . . .	. . . .	
⚠ ★	Power transformer (110–120V, 220–240V)	. . . .	. . . .	PTT-121	←	←	←	
⚠	AC power cord	PDG-023	←	PDG-028	←	←	←	
⚠ ★★	Voltage selector switch	. . . .	. . . .	PSB-011	←	←	←	
	Screw 3X10 (for voltage selector switch)	. . . .	. . . .	PPZ30P100FMC	←	←	←	
	PU cord	PDE-064	PDE-044	←	←	←	←	
	Cartridge (without stylus)	. . . .	. . . .	PXT-981	←	←	←	
	Dust cover	PNV-034	←	←	←	←	. . . .	
	Hinge assembly	PXB-155	←	←	←	←	. . . .	
⚠	Power supply assembly	XWR-006	←	XWR-018	←	←	←	

PACKING AND FURNISHED PARTS

Mark	Symbol & Description	PL-4 KUT type	PL-4 KCT type	
	Operating instructions (English)	PRB-191	←	
	Operating instructions (English/Spanish)	. . . .	. . . .	P
	Packing case	PHG-441	PHG-451	P
	Protector (L)	PHA-127	←	
	Protector (R)	PHA-128	←	
	Top pad	. . . .	. . . .	
	Cartridge mounting screw (W)	. . . .	. . . .	P

3. ELECTRICAL PARTS LIST

NOTES:
- *Parts without part number car*
- *The ⚠ mark found on som*
  safety factor of the part. Ther
  designation.
- *For your Parts Stock Cont*
  marks ★★ and ★ .
  ★★ GENERALLY MOVES
  This classification shall be adj
  number, temperature, humidit

Power Supply Assembly (XWR-018)

PL-4/R,R/G and PL-320/R,RF/G types

Mark	Part No.	Symbol & Description	
⚠	PCL-040	C1	Capacitor
⚠	RS2PF912J	R1	Resistor

e
l
e
l

320 ype	PL-320 RF/G type	Remarks
-329	←	
-082	←	
-085	←	
. .	. . . .	
-090	←	
092	←	
-095	←	
. .	. . . .	
-101	←	
-344	←	
–	←	
. .	. . . .	
–	←	
–	←	
–	←	
–	←	
–	←	
–	←	
–	. . . .	
–	. . . .	
–	←	

PACKING AND FURNISHED PARTS

Mark	Symbol & Description	Part No.						Remarks
		PL-4 KUT type	PL-4 KCT type	PL-4 R type	PL-4 R/G type	PL-320 R type	PL-320 RF/G type	
	Operating instructions (English)	PRB-191	←	. . . .	PRB-195	PRB-205	←	
	Operating instructions (English/Spanish)	. . . .	. . . .	PRE-004	. . . .	. . . .	. . . .	
	Packing case	PHG-441	PHG-451	PHG-465	PHG-452	PHG-458	PHG-459	
	Protector (L)	PHA-127	←	←	←	←	PHA-132	
	Protector (R)	PHA-128	←	←	←	←	PHA-133	
	Top pad	. . . .	. . . .	. . . .	PHC-049	. . . .	PHC-049	
	Cartridge mounting screw (W)	. . . .	. . . .	PBA-909	←	←	←	

3. ELECTRICAL PARTS LIST

NOTES:
- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Power Supply Assembly (XWR-018)

PL-4/R,R/G and PL-320/R,RF/G types

Mark	Part No.	Symbol & Description	
⚠	PCL-040	C1	Capacitor
⚠	RS2PF912J	R1	Resistor

4. SCHEMATIC DIAGRAMS

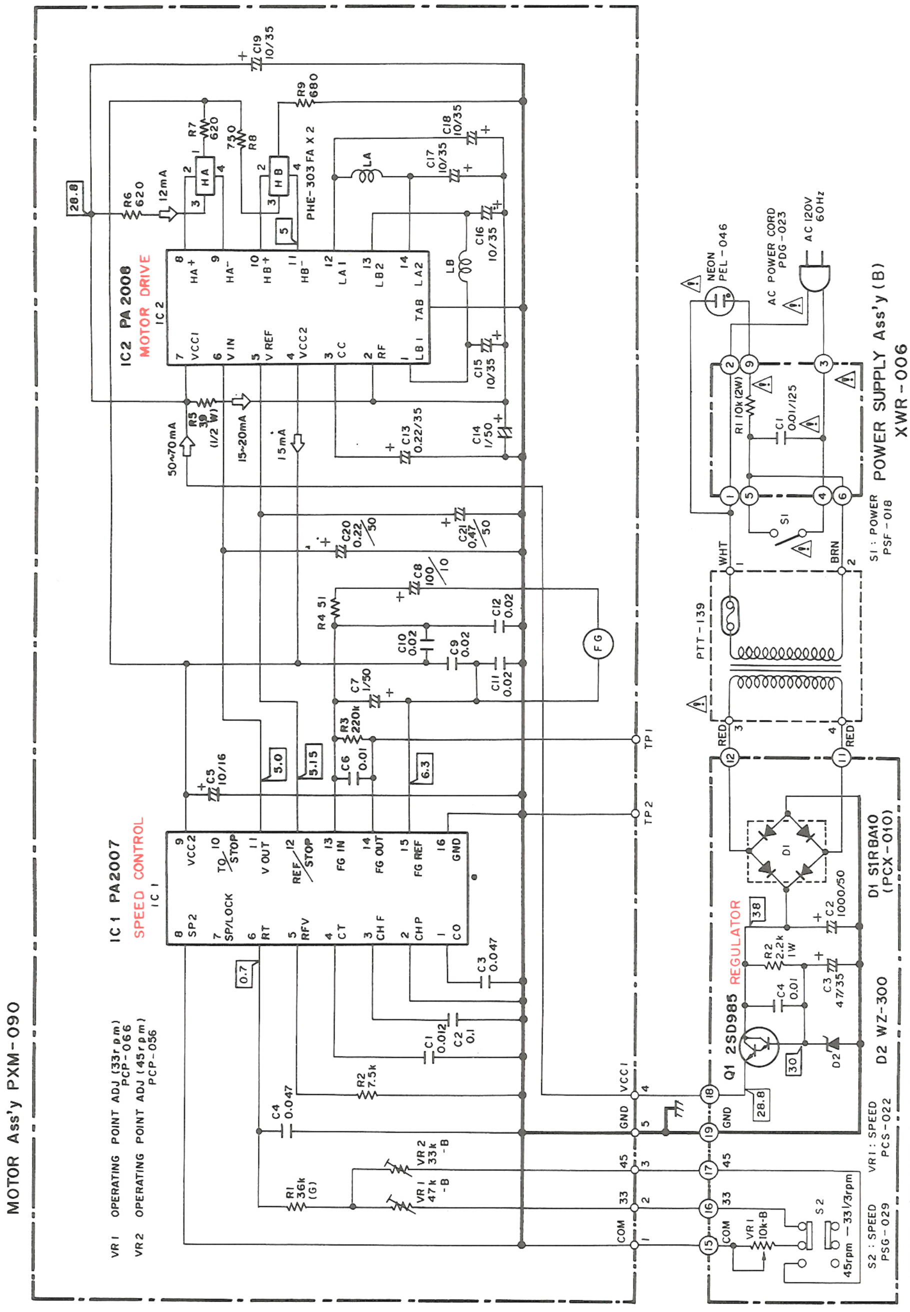
PL-4/KCT Type

1. RESISTORS:
   Indicated in Ω, ¼W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% (M) : ± 20% tolerance
2. CAPACITORS:
   Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF Indication without voltage is 50V except electrolytic capacitor.
3. VOLTAGE, CURRENT:
   ▭ : DC voltage (V) at no input signal
   ⇦ mA : DC current at no input signal
4. OTHERS:
   ⊘ : Adjusting point.
   The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

SWITCHES:
S1 : POWER ON — OFF
S2 : SPEED 33 1/3 rpm — 45 rpm

The underlined indicates the switch position.



IC2 PA2008 MOTOR DRIVE
IC1 PA2007 SPEED CONTROL
PHE-303 FA X 2
Q1 2SD985 REGULATOR
D1 S1RBA10 (PCX-010)
D2 WZ-300 XWM-057
PTT-139
NEON PEL-046
AC POWER CORD PDG-023
AC 120V 60Hz
POWER SUPPLY Ass'y (B) XWR-006
S1 : POWER PSF-018
MOTOR Ass'y PXM-090
POWER SUPPLY Ass'y (A) XWM-057
VR1 OPERATING POINT ADJ (33 rpm) PCP-066
VR2 OPERATING POINT ADJ (45 rpm) PCP-056
VR1 : SPEED PCS-022
S2 : SPEED PSG-029
45rpm — 33 1/3rpm
FG
TP1
TP2

PL-4/R, R/G and PL-320/R, RF/G Types

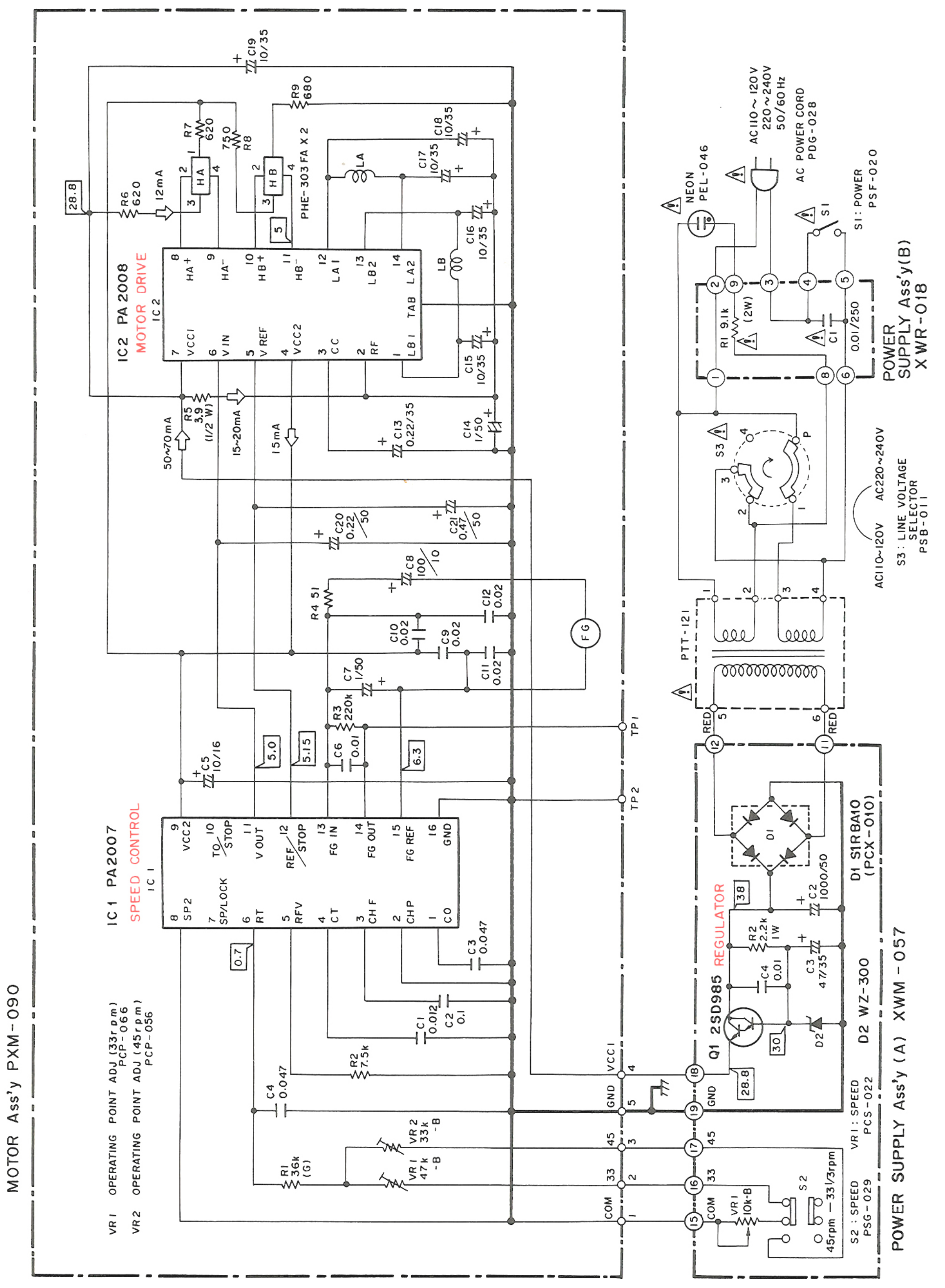
1. RESISTORS:
   Indicated in Ω, ¼W, ±5% tolerance unless otherwise noted k : kΩ, M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10% (M) : ± 20% tolerance
2. CAPACITORS:
   Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF Indication without voltage is 50V except electrolytic capacitor.
3. VOLTAGE, CURRENT:
   ▭ : DC voltage (V) at no input signal
   ⇦ mA : DC current at no input signal
4. OTHERS:
   ⊘ : Adjusting point.
   The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

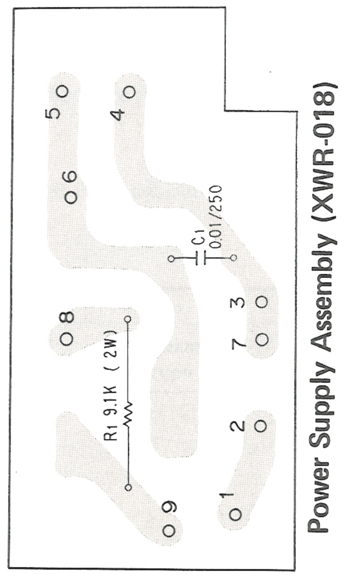
SWITCHES:
S1 : POWER ON — OFF
S2 : SPEED 33 1/3 rpm — 45 rpm
S3 : LINE VOLTAGE SELECTOR
AC110~120V — AC220~240V

The underlined indicates the switch position.

NOTE:
The indicated semiconductors are representative ones only. Other alternative semiconductors may be used and are listed in the parts list.



IC2 PA2008 MOTOR DRIVE
IC1 PA2007 SPEED CONTROL
PHE-303 FA X 2
Q1 2SD985 REGULATOR
D1 S1RBA10 (PCX-010)
D2 WZ-300 XWM-057
PTT-121
NEON PEL-046
AC POWER CORD PDG-028
AC110~120V 220~240V 50/60Hz
S1 : POWER PSF-020
POWER SUPPLY Ass'y (B) XWR-018
S3 : LINE VOLTAGE SELECTOR PSB-011
AC110~120V AC220~240V
MOTOR Ass'y PXM-090
POWER SUPPLY Ass'y (A) XWM-057
VR1 OPERATING POINT ADJ (33 rpm) PCP-066
VR2 OPERATING POINT ADJ (45 rpm) PCP-056
VR1 : SPEED PCS-022
S2 : SPEED PSG-029
FG
TP1
TP2



Power Supply Assembly (XWR-018)
R1 9.1K (2W)
C1 0.01/250